CLAIMS

What is claimed is:

1. A method of forming a pattern on a semiconductor wafer, the method comprising:

modulating light directed to a first portion of a photosensitive layer using a plurality of tilted mirrors in a mirror array; and

modulating light directed to a second portion of a photosensitive layer using a plurality of piston mirrors in the mirror array, the plurality of piston mirrors configured such that the displacement of the mirrors from a neutral plane of the mirror array creates varying degrees of interference of light waves on the image, the amount of interference corresponding to the degree of displacement.

2. The method of forming a pattern on a semiconductor wafer as recited in claim 1, wherein the tilted mirrors are controlled such that at least two adjacent mirrors generate a phase difference of about 520 degrees on a predetermined portion of the photosensitive layer.

3. The method of forming a pattern on a semiconductor wafer as recited in claim 1, wherein the tilted mirrors form a separate part of the mirror array from the piston mirrors.

4. The method of forming a pattern on a semiconductor wafer as recited in claim 1, wherein tilting and piston displacement modes are simultaneously performed on an individual mirror in the array.

5. The method of forming a pattern on a semiconductor wafer as recited in claim 1, wherein the piston mode is selected to mimic the functioning of resolution enhancement features.

6. The method of forming a pattern on a semiconductor wafer as recited in claim 1, wherein the individual mirrors having dual tilting and piston displacement

modes are used to write a first feature of the pattern and wherein at least one of tilted mirrors and piston mirrors are used to write a second feature of the pattern.

7. The method of forming a pattern on a semiconductor wafer as recited in claim 1, wherein the piston mirrors are configured such that two adjacent mirrors exhibit about 180 degrees in phase difference.

8. The method of forming a pattern on a semiconductor wafer as recited in claim 1, wherein the tilted mirrors are controlled such that at least two adjacent mirrors generate a phase difference in the range from about 400 to 600 degrees on a predetermined portion of the photosensitive layer.

9. The method of forming a pattern on a semiconductor wafer as recited in claim 1, wherein the piston mirrors are configured such that two adjacent mirrors exhibit a phase difference of about 280 degrees.

10. The method of forming a pattern on a semiconductor wafer as recited in claim 1, wherein the titled mirrors are arranged in an alternating row tilt configuration.

11. A maskless lithography system comprising:

a mirror array configured with a first plurality of mirrors, the first plurality configured to operate in at least a tilted configuration; and wherein the mirror array is configured with a second plurality of mirrors, the second plurality configured to operate in at least a piston displacement configuration

an illumination source configured for directing electromagnetic waves to the mirror array for imaging on a substrate; and

a stage configured to move the substrate in a raster pattern.

12. The maskless lithography system as recited in claim 11, wherein the first and second pluralities of mirrors are configured to each operate in a tilted configuration and a piston displacement configuration.

13. A method of forming a pattern on a reticle substrate, the method comprising:

modulating light directed to a first portion of a photosensitive layer using a plurality of tilted mirrors in a mirror array; and

modulating light directed to a second portion of a photosensitive layer using a plurality of piston mirrors in the mirror array, the plurality of piston mirrors configured such that the displacement of the mirrors from a neutral plane of the mirror array creates varying degrees of interference of light waves on the image, the amount of interference corresponding to the degree of displacement.

14. The method of forming a pattern on a recticle substrate as recited in claim 13, wherein the tilted mirrors are controlled such that at least two adjacent mirrors generate a phase difference of about 520 degrees on a predetermined portion of the photosensitive layer.

15. The method of forming a pattern on a recticle substrate as recited in claim 13, wherein the tilted mirrors form a separate part of the mirror array from the piston mirrors.

16. The method of forming a pattern on a recticle substrate as recited in claim 13, wherein tilting and piston displacement modes are simultaneously performed on an individual mirror in the array.

17. The method of forming a pattern on a recticle substrate as recited in claim 13, wherein the individual mirrors having dual tilting and piston displacement modes are used to write a first feature of the pattern and wherein at least one of tilted mirrors and piston mirrors are used to write a second feature of the pattern.

18. The method of forming a pattern on a recticle substrate as recited in claim 13, wherein the piston mirrors are configured such that two adjacent mirrors exhibit about 180 degrees in phase difference.

19. The method of forming a pattern on a recticle substrate as recited in claim 1, wherein the piston mirrors are configured such that two adjacent mirrors exhibit a phase difference of about 280 degrees.

20. The method of forming a pattern on a recticle substrate as recited in claim 13, wherein the titled mirrors are arranged in an alternating row tilt configuration.